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## THE MOLLUSCA OF MANDEVILLE, JAMAICA, AND ITS ENVIRONS.

BY HENRY A. PILSBRY AND AMOS P. BROWN.

The mollusks enumerated below were collected by one of us (Dr. Brown) during two visits to Jamaica, in February–March and May of this year; on the former occasion with assistance from Mr. Stewardson Brown. The material has been studied by both authors.

While the non-marine molluscan fauna of Jamaica might be considered well known, since most of the species have been described, yet it is really most imperfectly known. Very few forms have been examined anatomically; almost nothing has been observed of the relations of the many specialized forms to their environments; a large proportion of the species has not been figured, and many are scarcely recognizably described. Finally, our knowledge of the distribution of species is extremely imperfect. The Mandeville list may therefore prove useful, both as the most nearly complete fauna published for any Jamaican locality, and because definite localities are supplied for a large number of species hitherto known from no more exact habitat than “Jamaica.”

The “Contributions to Conchology” of Professor C. B. Adams was for the time a work of distinguished excellence; but it has a very serious defect in the omission of localities. Almost all of the species of Pfeiffer, Gray and Sowerby were also described as from Jamaica, without nearer localization. A list published by C. P. Gloyne<sup>1</sup> supplies localities for some species, but often only the Parish is mentioned. Mr. J. B. Henderson, Jr.,<sup>2</sup> has given a more extended list (248 species) in which the localities are carefully noted. Out of 55 species listed by him from “Mandeville,” 17 were not found in our material.<sup>3</sup> Adding

<sup>1</sup> *Journal de Conchyliologie*, XX, 1872, p. 26; XXIII, p. 115.

<sup>2</sup> *Nautilus*, VIII, 1894, pp. 1, 19, 31. See also C. T. Simpson, *Proc. U. S. Nat. Mus.* XVII, 1894, pp. 423–440, where several new forms are described. Other new species of *Urocoptidae*, *Achatinidae* and *Oleacinidae* from Mr. Henderson's collection have been described in the *Manual of Conchology*.

<sup>3</sup> These Mandeville species which we did not obtain are: *Varicella ligata*, *Sagda cookiana*, *S. epistylioides*, *S. arboreoides*, *Pleurodonte jamaicensis* *cornea*, *Cepolis subconica*, *Urocoptis inornata*, *Geomelania fortis*, *Aperostoma subrugosum*, *A. rupisfontis*, *A. crassum*, *Tudora proxima*, *Colobostylus tectilabris*, *C. banksianus*, *Helicina jamaicensis*. Probably Messrs. Henderson and Simpson listed all species collected within a radius of some miles as from Mandeville.

them to the 110 species enumerated below gives a total of 127 species of land snails for Mandeville and its environs. To this number, considerable additions may yet be made, chiefly among the very small species.

The tertiary limestones underly the region about Mandeville, exposed in nearly every roadside cut and in many small borrow-pits along the post-roads, and generally cropping out on every hill-top. On the slopes of the steeper hills the limestone often stands up in bold cliffs, especially on the higher hills of the northwest and west of the town,

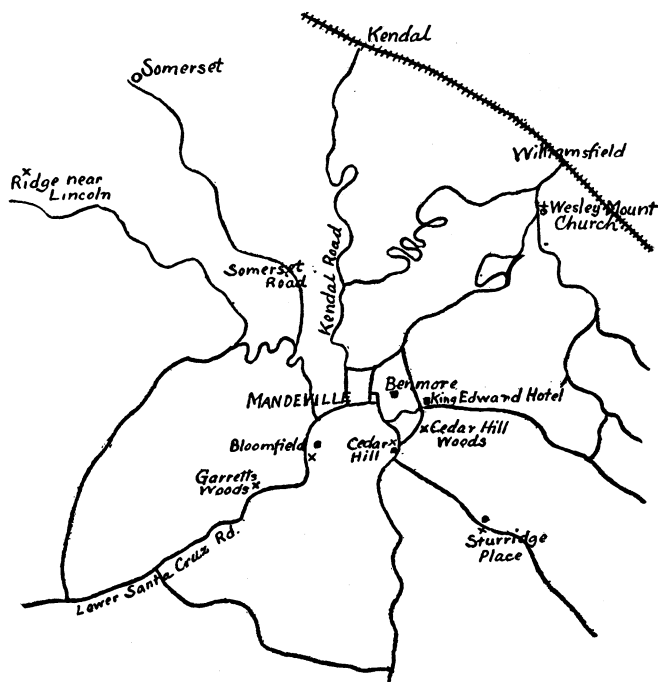


Fig. 1.—Sketch map of Mandeville and environs.

in the ridges towards the western border of the Parish of Manchester. The elevations run from about 1000 feet above sea level at Williamsfield to 2060 at Mandeville and 2700 on the ridge overlooking the valley of St. Elizabeth Parish and Black River. The entire country was evidently once covered with jungle or "bush" throughout, but in the more cultivated parts the ground has been cleared of woods except on the tops of the stony hills.

There are no streams or other surface water in this part of Man-

chester except what is collected in the cattle pools and drinking water cisterns, but the washing of the surface by torrential rains has had its effect in shaping the topography. The rain water, however, soon passes underground, and these underground waters have honeycombed the limestones, forming numerous caves and pipes in the limestone and resulting in sinks and "cockpits," so that the entire surface is covered with cup-shaped valleys, more or less surrounded by hills, and is very uneven, a few acres of level ground being rarely found. The hills are generally steep, in many places limestone cliffs of 20 to 50 feet high rising abruptly on their slopes; the hill-tops very frequently show base rock in places. On this account the hill-tops have often been left covered by jungle except where the wood was needed for fire-wood, etc.; but even these are often cleared, especially on the lower ground towards Williamsfield and Porus, and to a less degree along the roads towards Kendal, so that only fruit trees or occasional shade trees remain.

Along the Williamsfield road, at Wesley Mount Church, and on the parish roads to the south in the direction of Porus to Sterridge's Place and beyond, as well as along the Newport road running out of Mandeville to the south, most of the hills have been cleared of trees and large patches of woods are not common, but a few bits of the original forest remain. Such are the woods at Benmore and at the King Edward Hotel and the woods opposite Cedar Hill. The species obtained at Wesley Mount Church were from the roadside on the limestone sand and rock and at the base of the limestone walls. These limestone walls are a feature of the region; they line the roads everywhere. They are built from the stone gathered in the adjoining field, without plaster, and as the limestone weathers soon become the home of numerous species of snails. Much of the roadside collecting is from the walls, especially after a rain, when the animals crawl out on the surface of the walls and may be gathered in quantities. At Sturridge's the country has been completely denuded of trees and the small collection made there came entirely from the walls. At Cedar Hill there are no trees, the collection was taken from a low limestone cut about ten feet high along the roadside. The Bloomfield colony lives on a similar cut, and a steep hillside rising above it, where some trees shade the road. These conditions continue for about one-third of a mile. Garrett's woods is a hill top covered with almost untouched virgin forest, but is only some five or six acres in extent. The specimens from the Lower Santa Cruz road are from small roadside cuts, some in limestone and some in the red residual clay from its weathering,

with occasional collections from the damp shady borrow pit holes and caves along the road. Many specimens were gathered from the stone walls along this road. There are not many places beyond Garrett's woods along this road "2 to 4 miles from Mandeville" where the woods touch the road, but a few were explored, generally caves and borrow pits; the ground rises in this direction to perhaps 2500 feet above sea level at four miles from Mandeville.

To the west and northwest of Mandeville there is more of the original forest remaining uncleared, and at Somerset there is considerably more forest than cleared land. The ridge near Lincoln, the most western point explored in this region, rises to some 2,700 feet above sea level, and lies to the north of the road. It overlooks the valley of the Black River and St. Elizabeth Parish, and from it may be seen the Santa Cruz mountains in the distance. The hill-top is rocky with the honeycombed limestone in place, and rising in many chimneys and spires, forming a very favorable habitat for the species found, but the woods has been somewhat disturbed by cutting of firewood, though evidently never cleared. Out the Kendal road, to the north of Mandeville, the ground is thoroughly cultivated and again few patches of original forest come down to the road. The specimens were mostly obtained from stone walls and low roadside cuts in the limestone down to about 1,500 feet above sea level. In a few places the forest touched the road and collections were made along the cuts at these places, but the woods were not explored.

The colony on the Somerset road, near the 2 mile post from Mandeville (about three miles from the town), was a patch of woods and a small quarry or borrow pit, on the north slope of a hill overlooking the valley of Williamsfield and Kendal, and was at about the elevation of Mandeville. From this point onward the parish road to Somerset is shaded by the trees of the portions of the original forest that are here quite extensive. The hills are more abrupt and the cliffs rise in many places 50 to 100 feet or more. At Somerset, about six miles from Mandeville, the woods are so nearly continuous that there is no bar to the free migration of the species from one to another, but still it is evident that there are a number of distinct colonies. Collections were made from the roadside cuts and walls, in the stony pastures and woods, from the cliffs and from a dissected cave and a sink hole. The woods and cliffs were principally explored, and under stones and in rock piles many specimens were taken alive. The limestone in places wears into cylindrical more or less vertical holes of all sizes up to ten feet in diameter, and in these many dead shells

are found. At the bottom of a fissure in the limestone or under a cliff at the base is generally found a grave-yard of these shells, often several bushels in the space of a few feet. Fresh shells are more uncommon. As the woods are here all connected more or less, no attempt was made to keep the colonies separate, but from a study of these dead shells it would probably be easy to distinguish a number. About twenty different hills were explored from the base to the top, besides the caves and sink noted above, and many specimens were taken from small exposures and stone piles in the cleared ground. The elevation of the road at Somerset is about 2,200 feet above sea level, and the hills rise for 200 or 300 feet more in some cases.

#### HELICIDÆ.

**Cepolis (Dialeuca) nemoraloides** (C. B. Ad.).

Woods opp. Cedar Hill; Lower Santa Cruz road, about 3 miles southwest of Mandeville.

**Cepolis (Dialeuca) conspersula** (C. B. Ad.).

Somerset.

**Cepolis (Hemitrochus) graminicola** (C. B. Ad.).

Benmore, Mandeville; roadsides about 3 miles north and east of Mandeville; Cedar Hill; Santa Cruz road, common all along the road; Somerset road; Somerset.

**Pleurodonte bainbridgei** (Pfr.).

Cedar Hill, woods near King Edward's Hotel, Garrett's woods, ridge near Lincoln, and at Somerset. The pale variety *pretiosa* was not found.

**Pleurodonte acuta goniasmos** ('A. D. Brown' Pils.).

Kendal road, 3-3½ miles northwest of Mandeville; near Bloomfield; woods at Benmore Hotel and King Edward's Hotel, Mandeville; Cedar Hill; Garrett's woods; Santa Cruz road, 2-4 miles out; Somerset road, 2 miles out; ridge near Lincoln; Somerset.

The form from Somerset is rather large, resembling figures 60, 62, 63, 64 of plate 26, *Manual of Conchology*, V, though neither of those figures is wholly like the prevalent type.<sup>4</sup>

The form from other localities mentioned is smaller and higher. It has not been illustrated, though abundant and well known, but plate 26, fig. 59 of the *Manual*, Vol. V, somewhat resembles it. *Helix*

<sup>4</sup> Figures 59, 63, 64 of plate 26 of the *Manual*, Vol V, do not represent *P. nobilis* C. B. Ad., which Pilsbry had not correctly identified at the time that volume was written. Figures 5, 59, 60, 62, 63, 64 of that plate are all forms of *goniasmos*, of which *nannodonta* A. D. B. is merely a form.

*abnormis* Pfr. was apparently based on a pathologic individual of this small race. The forms of *P. acuta* from this region will be considered in a later paper by one of us.

*Pleurodonte acuta acuta* (of which *lamarckii* Fér. and *acutissima* Lam. are absolute synonyms) is found near the coast, at Swift River, and in a less typical form around to Bowden.

***Pleurodonte sinuata* (Müller).**

Kendal road, 3½ miles north of, and Benmore and Bloomfield in Mandeville; woods at King Edward's Hotel and opposite Cedar Hill, Garrett's woods, Santa Cruz road, 2-4 miles southwest of Mandeville; ridge near Lincoln; Somerset. Found everywhere, in some abundance, living under stones and leaves, in the woods.

***Pleurodonte anomala* (Pfr.).**

Found with *P. sinuata*, probably everywhere, but not taken at Bloomfield or Cedar Hill woods.

***Pleurodonte picturata* (C. B. Ad.).**

Kendal road, about 3½ miles northwest of Mandeville. Only three bleached specimens of the small form, diam. 22 mm.

***Pleurodonte cara* (C. B. Ad.).**

Somerset.

***Pleurodonte peracutissima* (C. B. Ad.)**

Bloomfield and Benmore, Mandeville; wood near King Edward's Hotel; Kendal road about 2 miles north of Mandeville, in stone walls; woods opposite Cedar Hill; Garrett's woods, Santa Cruz road, 2-4 miles southwest of Mandeville; ridge near Lincoln; Somerset road; Somerset, abundant.

***Pleurodonte* (*Dendrocochlis*<sup>5</sup>) *aspera* (Fér.).**

Found at all the localities visited; very abundant everywhere even in the town. Arboreal.

***Pleurodonte* (*Eurycratera*) *jamaicensis* (Gmel.).**

Found at all the localities, but larger and more abundant westward of Mandeville, towards Somerset and Lincoln. Terrestrial, living in holes in the rocks.

***Zaphysema macmurrayi* (C. B. Ad.).**

Bloomfield, Mandeville; Garrett's woods; ridge near Lincoln; Somerset.

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<sup>5</sup> *Dendrocochlis* n. subg. for *aspera* and *cognata*, the former type of the subgenus

**Zaphysema tunicata** (C. B. Ad.).

Woods opposite Cedar Hill, near Mandeville; Kendal road; ridge near Lincoln; Somerset.

This is *Helix tumida* Pfr. not Gmelin.

**Zaphysema tenerrima** (C. B. Ad.).

Woods opposite Cedar Hill; Somerset.

**Proserpinula margaritella** n. sp.

Wesley Mount Church, near Williamsfield.

**Proserpinula infortunata** (Bland).

*Helix infortunata* Bld., Annals and Lyc. Nat. Hist. of N. Y., VI, 1854, p. 78; 1855, p. 149.

Woods opposite Cedar Hill, and at King Edward's Hotel; Somerset.

Bland in 1854 transferred this species from *Proserpina* to *Helix* on the ground that in it the internal partitions are not absorbed, as they are in the *Proserpinidae*. In 1855 he stated, on the authority of the Hon. Edward Chitty, that the animal "is the same as of *Helix*." Albers (*Die Heliceen*, 1860, p. 77) instituted the new group *Proserpinula* which he ranks as a subgenus of *Sagda*, placing in it the species *discoidea* C. B. Ad. and *opalina* C. B. Ad. (= *infortunata* Bld.). Tryon in Vol. II of the *Manual of Conchology*, p. 201, considers *Proserpinula* a section of *Zonites*.



Fig. 2.—Central and lateral teeth of *P. infortunata*.

The radula of a decayed specimen we have examined was imperfect, only the central and lateral teeth being preserved. These are of the type found in *Thysanophora*, *Sagda* and *Zaphysema*. The central has a short, wide basal-plate, the mesocone projecting well beyond it, side cusps well developed. The laterals (at least 11 on each side) are similar but asymmetrical by suppression of the entocone (Fig. 2).

*P. infortunata* is oviparous, the egg-capsules rather large, with calcareous shell.

**Thysanophora turbiniformis** (Pfr.).

Sterridge's place, 3 miles southeast of Mandeville; Lower Santa Cruz road; Somerset.

**Thysanophora subpyramidalis** (C. B. Ad.).

Woods opposite Cedar Hill; Lower Santa Cruz road; ridge near Lincoln, Somerset.

**Thysanophora depressa** (C. B. Ad.).

Benmore, Mandeville; Cedar Hill; Lower Santa Cruz road; Somerset road.



**Thysanophora boothiana** (Pfr.) ?.

Kendal road, 1 mile north of Mandeville; Cedar Hill; Sterridge's place; Lower Santa Cruz road; Somerset road; Somerset. The identity of this shell with the Cuban *T. boothiana* is doubtful, but it is apparently what Adams so identified.

**Thysanophora anthoniana** (C. B. Ad.).

Somerset.

**Thysanophora epistyliolum** (C. B. Ad.).

Woods at Benmore, Mandeville; woods opposite Cedar Hill; Somerset.

**Thysanophora inconspicua** (C. B. Ad.).

Near Mandeville.

**Thysanophora diminuta** (C. B. Ad.).

Near Mandeville; ridge near Lincoln.

**Thysanophora dioscoricola** (C. B. Ad.).

Near Mandeville.

**Sagda jayana** (C. B. Ad.).

Kendal road,  $3\frac{1}{2}$  miles north of Mandeville. Benmore and Bloomfield, Mandeville; woods at King Edward's Hotel; woods opposite Cedar Hill; Garrett's woods; Santa Cruz road, 2-4 miles southwest of Mandeville; ridge near Lincoln; Somerset.

The young shells at a certain stage are perforate. The two internal lamellæ were found constant in a large number opened. It is an extremely abundant species.

**Sagda grandis** n. sp.

Somerset.

**Sagda connectens** (C. B. Ad.).

Somerset.

**Sagda alveare** (C. B. Ad.).

Somerset and along roadsides near Mandeville.

**Sagda foremaniana** (C. B. Ad.).

Somerset; ridge near Lincoln.

**Sagda simplex** n. sp.

Somerset.

**Sagda hollandi** (C. B. Ad.).

Somerset.

**BULIMULIDÆ.**

**Drymæus immaculatus** (C. B. Ad.).

Garrett's woods; Somerset.

**Oxystyla undata** (Brug.).

Benmore, Mandeville, from trees in the garden, two large specimens, probably imported from Trinidad. It is not the well-known Jamaican form of *Oxystyla*.

**ACHATINIDÆ.**

**Opeas miora** (Orb.).

Wesley Mount Church near Williamsfield; Benmore, Mandeville.

**Subulina octona** (Brug.).

Benmore, Mandeville; Cedar Hill.

**Leptinaria lamellata** (P. and M.).

Benmore, Mandeville.

**Leptinaria striosa abdita** (Poey).

Benmore, Mandeville; Sterridge's place; Lower Santa Cruz road; Somerset road, 2 miles from Mandeville; Somerset.

**Leptinaria robertsi** Pils.

Cedar Hill; near Mandeville. No exact locality was hitherto known.

**UROCOPTIDÆ.**

**Urocoptis ambigua** (C. B. Ad.).

Wesley Mount Church, near Williamsfield; Kendal road, 3 miles north of Mandeville; Benmore, Mandeville; King Edward's Hotel, woods opposite Cedar Hill, Garrett's woods, Lower Santa Cruz road, near Mandeville; ridge near Lincoln; Somerset. Abundant throughout the region, on stone walls and stone piles in open woods, etc.

**Urocoptis rosea** (Pfr.).

Benmore, Mandeville.

**Brachypodella gracilis** (Wood).

Abundant around Mandeville, north and west, on walls along the roadsides; Kendal road,  $3\frac{1}{2}$  miles north of Mandeville; ridge near Lincoln; Somerset, on cliffs.

**Spirostemma dunkeri** (Pfr.).

Ridge near Lincoln, on rocks.

**Spirostemma tenera** (C. B. Ad.).

Near Mandeville.

**Spirostemma mandevillensis** n. sp.

Somerset road, 2 miles from Mandeville.

**Anoma splendens** ('Mke.' Pfr.).

Bloomfield, Mandeville; Somerset.

**Anoma splendens citrina** (C. B. Ad.).

Williamsfield road, 2 miles south of Williamsfield; Garrett's woods; near Mandeville; Somerset road; Somerset.

**Anoma alboanfractus paivana** (Pfr.).

Somerset.

**Microceramus gossei** (Pfr.).

Wesley Mount Church, 1 mile south of Williamsfield; Benmore, Mandeville; Sterridge's place, 3 miles southeast of Mandeville; Santa Cruz road; Somerset. Everywhere abundant along roadsides and walls.

#### OLEACINIDÆ.

**Varicella philippiana elegans** (C. B. Ad.).

Garrett's woods, near Mandeville; ridge near Lincoln; Somerset.

**Varicella venusta** (Pfr.).

Somerset.

**Varicella procera** (C. B. Ad.).

Ridge near Lincoln; Somerset.

**Varicella mandevillensis** Pils.

Somerset road, 2 miles northwest of Mandeville; Sterridge's place, about 3 miles southeast of Mandeville; also from roadsides north and east of Mandeville.

**Varicella blandiana** (C. B. Ad.).

Benmore, Mandeville; woods at King Edward's Hotel; Santa Cruz road, about 3 miles southwest of Mandeville; Somerset.

**Varicella proxima** (C. B. Ad.).

Woods opposite Cedar Hill.

**Varicella dissimilis** Pils.

Somerset.

**Varicella near clappi** Pils.

Bloomfield, Mandeville. A single imperfect specimen.

**Varicella cochlidium** Pils.

Wesley Mount Church, near Williamsfield, and along the road toward Mandeville.

**Varicella rapax** n. sp.

Somerset.

**Varicella similis sloaneana** Pils.

Kendal road, 3 miles north of Mandeville.

**Spiraxis mirabilis** C. B. Ad.

Somerset.

**Spiraxis procerus** (C. B. Ad.).

Benmore, Mandeville.

**Spiraxis parallelus** Pils.

Somerset; woods at King Edward's Hotel, near Mandeville.

**Spiraxis læviusculus** C. B. Ad.

Near Mandeville.

**Spiraxis perplexus** C. B. Ad.

Near Mandeville; Somerset.

**Spiraxis terebella** C. B. Ad.

Near Mandeville.

**Pseudosubulina problematica** Pils.

Near Mandeville.

#### ZONITIDÆ.

**Guppya gundlachi** (Pfr.).

Near Mandeville. The generic synonyms are as follows:

*Guppya* Mörch, Journ. de Conchyl, XV, 1867, p. 256, for *Conulus vaccus* [vacans] Guppy.

*Habroconus* Fischer et Crosse, Miss. Sci. Mex., Moll. (1878), I, pp. 154, 171.

Type *Helix selenkai* Pfr.

*Ernstia* Jousseau, Mém. Soc. Zool. France, II, 1889, p. 250, for *Ernstia ernsti* Jous.

#### LIMACIDÆ.

**Agriolimax** sp. undet.

A single shell not unlike *A. agrestis* was picked out of dirt collected near Mandeville.

#### SUCCINEIDÆ.

**Succinea latior** C. B. Ad.

Kendal road 3 miles from Mandeville; Wesley Mount Church; Benmore, Mandeville; Cedar Hill; Sterridge's place; Lower Santa Cruz road; Somerset. It is found sparsely almost everywhere in the grass.

#### PUPILLIDÆ.

**Bifidaria pellucida** (Pfr.).

Near Mandeville.

**Bifidaria servilis** (Gld.).

Garrett's woods and elsewhere near Mandeville. A form with the

teeth weak, the upper palatal plica very minute, basal plica absent or excessively weak.

***Bifidaria rhoadsi* Pils.**

Near Mandeville. New to Jamaica. The specimens are smaller than the types from Miami, Florida, measuring, length 1.5, diam. .85 mm.

***Vertigo (Bothriopupa) tenuidens* C. B. Ad.**

Around Mandeville and at Somerset. This species differs from *V. variolosa* of Florida by its rather more robust contour and strong upper palatal plica. Probably *Bothriopupa* will be removed from *Vertigo* on account of its long, entering parietal lamella; yet it does not seem to belong to *Bifidaria*.

**VERONICELLIDÆ.**

A species of *Veronicella* about 25 or 30 mm. long was seen under stones, but none were collected.

**TRUNCATELLIDÆ.**

***Geomelania minor* C. B. Ad.**

Wesley Mount Church, near Williamsfield; Benmore, Mandeville; Somerset road and Somerset.

***Geomelania gracilis* (C. B. Ad.).**

Wesley Mount Church, near Williamsfield; Bloomfield and Benmore, Mandeville; Somerset.

***Geomelania elegans* C. B. Ad.**

Near Mandeville.

***Geomelania (Scalatella) pygmæa* (C. B. Ad.).**

Neighborhood of Mandeville.

***Geomelania (Scalatella) microglypta* n. sp.**

Near Mandeville.

**CYCLOPHORIDÆ.**

***Aperostoma (Ptychocochlis) jamaicense* (Sowerby).**

Benmore, Mandeville; King Edward's Hotel, woods opposite Cedar Hill; Garrett's woods; Santa Cruz road, 2-4 miles southwest of Mandeville; two miles out the Somerset road; ridge near Lincoln; Somerset. Found everywhere.

***Aperostoma (Ptychocochlis) varians* (C. B. Ad.).**

King Edward's Hotel, woods opposite Cedar Hill, Garrett's woods, Santa Cruz road, 2-4 miles west of Mandeville; 2 miles out the Somerset road; ridge near Lincoln; Somerset.

A single depressed, more widely umbilicate *Ptychocochlis* was found on the ridge near Lincoln. It probably represents another species.

#### ERICIIDÆ (CYCLOSTOMATIDÆ).

The Jamaican Cyclostomas differ from *Ericia elegans* of Europe by the form of the muzzle, which is deeply bifid at the end, not flattened and disk-like distally, as Fischer figures that of *E. elegans*. In creeping the muzzle takes no part, and is not applied to the ground except occasionally for the purpose of feeling. The foot is divided lengthwise by a median sulcus, only the two outer edges being in contact with the earth in crawling, which is effected by the passage of high narrow folds or waves from the tail forward alternately on the two sides, only one at a time on a side. The wave lifts free from the support, as shown in fig. 3, so that there is no sliding motion of the sole against the ground. Viewed from in front or behind the snail has an absurd appearance of striding along on stumpy legs. These observations were made on *Colobostylus jayanus rufilabris* (Ad.) and *Tudora armata* (Ad.)<sup>5</sup>.

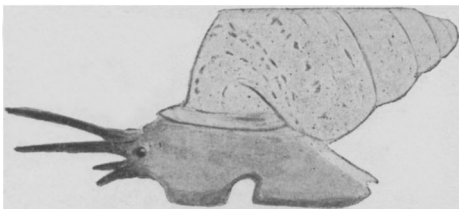


Fig. 3.—*Colobostylus jayanus rufilabris* (Ad.). Fig. 4.—Head of same, from above.

*Colobostylus jayanus* (C. B. Ad.).

Roadside north of Mandeville; ridge near Lincoln; Somerset.

*Colobostylus jayanus rufilabris* C. B. Ad. Figs. 3, 4.

Kendal road, 2 miles north of Mandeville, on stone walls; Benmore, Mandeville; woods at King Edward's Hotel; Somerset road, 2 miles northwest of Mandeville.

<sup>5</sup> It may be of interest in this connection to quote Dr. Jousseume's account of the walking of *Ericia elegans*. The foot is divided by a median line or raphe. "Pour avancer, l'animal glisse en avant l'une des moitiés artificielles de son pied et lorsqu'elle a dépassé l'autre du quart, plus au moins, de son longueur, elle s'arrête, pendant que l'autre moitié sort de son immobilité et s'avance à son tour, dépasse sa congénère que se remet alors en mouvement. Cette progression alternative se fait sans interruption; elle est continue comme dans les autres modes. Qu'on suppose un homme, les deux pieds dans un sac, avançant en glissant le pied droit, puis le pied gauche et ainsi de suite successivement et l'on aura une idée exacte de la progression d'un Cyclostome" (Bull. Soc. Zool. France, Vol. 34, 1909, p. 113).

Lives in rather open places, as in the crevices of stone walls, and in the edges of woods.

The foot is bluish-gray, tentacles, rostrum and eyes black.

**Colobostylus banksianus** (Sowb.).

Somerset road, 2 miles west of Mandeville; Somerset.

**Annularia fimbriatula** (Sowb.).

Bloomfield and Benmore, Mandeville; King Edward's woods, woods opposite Cedar Hill and Garrett's woods near Mandeville; Santa Cruz road, 2-4 miles from Mandeville.

The living snail is very handsome. The foot is flesh-pink, paler in front, shading to bright red behind in the region of the operculum; the whole flecked with opaque white; dorsal surface (neck) and front edge almost white. The tentacles are deep carmine, the rostrum grayish-fleshy with black spots and flecks, closer on the sides.

**Adamsiella variabilis** (C. B. Ad.).

Somerset.

**Adamsiella ignilabris** (C. B. Ad.).

Near Mandeville; Somerset; ridge near Lincoln.

**Tudora fecunda** (C. B. Ad.).

Somerset.

**Chondropoma mordax** (C. B. Ad.).

Roadsides near Mandeville.

Lives in the woods. It is very common near Mandeville but was not seen around Somerset.

**Rhytidopoma fraterminor** n. sp.

Wesley Mount Church, 1 mile south of Williamsfield.

#### HELICINIDÆ.

**Helicina neritella** Lam.

Roadsides about 3 miles northeast of Mandeville; woods opposite Cedar Hill and Santa Cruz road near Mandeville; Somerset. Abundant, living in the open.

**Helicina jamaicensis** Sowb.

Bloomfield, Santa Cruz road, and Somerset road, near Mandeville; Somerset. Abundant.

**Stoastoma pisum** (C. B. Ad.).Fig. 5.—*S. pisum*.

Benmore and Bloomfield, Mandeville; Garrett's woods, crawling on stones; Lower Santa Cruz road, 3 miles from Mandeville;

The dentition of *S. pisum* (fig. 5) confirms the position of this genus in the *Helicinidæ*. The marginal teeth are simply hook-shaped and very numerous. The outer tooth of the middle field has no cusp. Other characters

are sufficiently shown by the figure.

**Stoastoma gouldianum** C. B. Ad.

Near Mandeville.

**Stoastoma (Fadyenia) grayanum** (Chitty).

Near Mandeville.

**Stoastoma (Petiti) cumingianum** (C. B. Ad.).

Woods at King Edward's Hotel, 1 mile from Mandeville; Garrett's woods; Somerset.

**Stoastoma (Petitia) fortuneanum** (Chitty).

Near Mandeville.

**Stoastoma (Metcalfia) chittyianum** C. B. Ad.

Near Mandeville.

**Alcadia major** Gray.

Somerset, very abundant.

**Alcadia palliata** (C. B. Ad.).

Benmore, Mandeville; roadsides north and east of Mandeville; 2 or 3 miles out; Santa Cruz road, 2-4 miles southwest of Mandeville; Somerset road, 2 miles out; also at Somerset, very abundant.

**Alcadia albolabris** (C. B. Ad.).

Roadsides, 3 miles north of Mandeville, towards Williamsfield; Cedar Hill, 1 mile south of Mandeville; Somerset. Not common.

**Alcadia hollandi** (C. B. Ad.).

Garrett's woods near Mandeville; ridge near Lincoln; Somerset road, 2 miles west of Mandeville; Somerset. Abundant.

**Alcadia pusilla** (C. B. Ad.).

Somerset road, 2 miles out from Mandeville; Somerset.

**Eutrochatella pulchella** (Gray).

Williamsfield road about 3 miles from Mandeville; woods at King Edward's Hotel; woods opposite Cedar Hill, and Garrett's woods, near Mandeville; ridge near Lincoln; Somerset. Found crawling



on rocks in the woods, not found copiously, but generally distributed around Mandeville.

*Eutrochatella pulchella* is transparent whitish, the rostrum and sides of foot maculated and dotted with black, tentacles clear whitish, eyes at their outer bases. It glides with the distal disk of the short muzzle in contact with the ground. When travelling on a dry table it sometimes raised the forward part of the foot.

The name *Trochatella* being preoccupied by Lesson, Fischer in 1885 proposed to substitute *Eutrochatella*, type *T. pulchella*.

The Cuban group of large species has been called *Hapata* by Wagner in his monograph in the *Conchylien Cabinet* now appearing, but it should bear the name *Viana* (type *Helicina regina* Morelet), the references being as follows:

*Viana* H. and A. Adams, *Genera of Recent Mollusca* II, p. 305, March 1856, for *regina* and *sagra*.

*Hapata* Gray, *Annals and Magazine of Natural History* (2 Ser.), XVIII, November 1856, p. 414. Monotype *Helicina regina* Morel.

*Rhynchocheila* Shuttleworth, *Notitiæ Malacologicæ* II, 1878, p. 15. Monotype *H. regina* Morel.

***Lucidella aureola* (Fér.).**

Mt. Wesley Church near Williamfield; Bloomfield and other places within a mile of Mandeville; Santa Cruz road; Somerset, on shady stone walls.

***Lucidella undulata* Pfr.**

Roadsides a mile north of Mandeville; Benmore and Bloomfield, Mandeville; Sterridge's place, about 3 miles southeast of Mandeville; Cedar Hill; Santa Cruz road, 2-4 miles southwest of Mandeville; ridge near Lincoln; Somerset road 2 miles west of Mandeville; Somerset.

Very variable in sculpture, often found in mossy places on stone walls; larger in shaded places.

***Lucidella adamsiana* Pfr.**

Benmore and Bloomfield, Mandeville; King Edward's Hotel, and Somerset road, near Mandeville; Somerset.

***Lucidella lineata* (C. B. Ad.) (*L. nana* Pfr.).**

Benmore and King Edward's Hotel, Mandeville.

## PROSERPINIDÆ.

***Proserpina nitida* Gray.**

Benmore, Mandeville; King Edward's woods, woods opposite

Cedar Hill, Garrett's woods and Lower Santa Cruz road, near Mandeville; ridge near Lincoln; Somerset.

*Descriptions of New Species.*

***Zaphysema buddiana avus* n. subsp.**

The shell has the sub-globular, somewhat depressed shape of *Z. buddiana*, but is very much larger with about the same number of whorls. The spire is low and very obtuse. The surface, where unworn, shows delicate and rather close punctation, as in the typical form.

Alt. 24, diam.  $30\frac{1}{2}$  mm.; whorls  $4\frac{1}{2}$ .

" 25, " 30 " "  $4\frac{1}{2}$ .

Westmoreland. Types No. 795, A. N. S. P., collected by W. J. Holland, and received with the A. D. Brown collection.

***Proserpinula margaritella* n. sp. Fig. 6.**

The shell is subdiscoidal, biconvex; thin, polished, very faintly marked with minute growth-lines. Spire low, convex. Whorls 4,

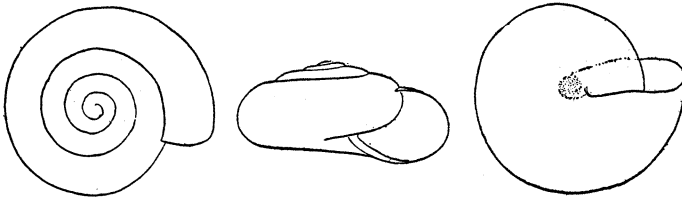


Fig. 6.—*Proserpinula margaritella*.

moderately convex, joined by a distinctly impressed suture, the last rounded peripherally, the base depressed, deeply sunken at the axis, though there is no true umbilicus. The aperture is slightly oblique, of a broad, depressed lunate shape. Peristome simple, the outer lip evenly arcuate; basal margin straightened, columellar margin very short and arcuate; not thickened. Central callus very small and extremely thin. There is no perceptible internal callus and no teeth or lamellæ. Alt. 1.75, diam. 3.8 mm.

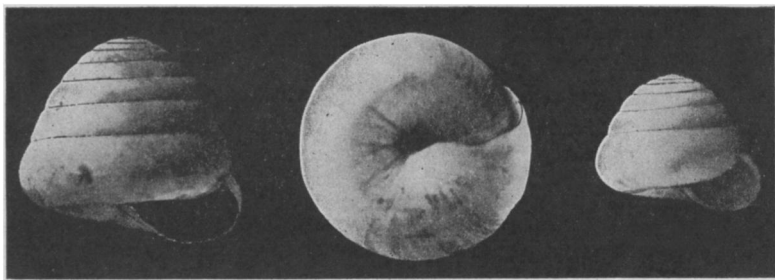
Wesley Mount Church, one mile south of Williamsfield. Types No. 101,430, A. N. S. P., collected by Dr. A. P. Brown, 1910. Other specimens were taken in the neighborhood of Mandeville, exact locality not noted.

This species is related to *P. discoidea* (C. B. Ad.), but it differs by the comparatively wider spire and much narrower last whorl (as seen

in a dorsal view), and the smaller size, a specimen of *T. discoidea* with  $3\frac{1}{2}$  whorls measuring 6 mm. in diameter.

***Sagda grandis*** n. sp. Figs. 7, 8.

The shell is large, solid and high, the diameter not much exceeding the height; white under a very thin pale yellow cuticle. The spire is dome-shaped above; whorls about  $9\frac{1}{2}$ , somewhat convex, the first  $1\frac{3}{4}$  nearly smooth, several following whorls densely and regularly sculptured with fine, close, slightly curved, retractive striæ, but on the last two whorls they become almost obsolete; on the later whorls, especially the last two, a secondary sculpture of extremely minute vertical and slowly ascending spiral threads appears. On the base this is wanting; and denuded shells show traces of it like an extremely fine fabric pressed into plastic clay. The last whorl in front view is double the width of the preceding, is rounded peripherally, rather convex on the base, and rather deeply excavated around the axis. Aperture of the usual lunate shape. The basal lamina varies from



Figs. 7, 8.—*Sagda grandis*.

Fig. 9.—*Sagda spei*.

$\frac{1}{2}$  to one whorl long and is very high. It revolves at or barely within the greatest convexity of the base. The columellar lamella is either entirely wanting or low, blunt and weak, high on the axis.

Alt.  $26\frac{1}{2}$ , diam.  $28\frac{1}{2}$  mm.

" 26 , " 29 "

Somerset, Manchester. Types No. 100,883, A. N. S. P., collected by Dr. A. P. Brown, May, 1910.

This fine *Sagda* is one of the largest of the genus. It occurs with *S. jayana* (C. B. Ad.) from which it differs by (1) the weakness or absence of a columellar lamella (2) the position of the basal lamella, which revolves decidedly nearer the center than in *S. jayana*. (3) the apical whorls, which are distinctly larger in *grandis* than in *jayana*

(4) the secondary microscopic sculpture of *S. grandis*, resembling a woven fabric.

This may be the form which C. B. Adams mentions (*Contrib. to Conch.*, p. 173) as a large form of *Helix epistylum*, but it is not the species so named by Müller. Thirty specimens were taken.

Probably C. B. Adams' *Helix epistylum* var. *minor* from Westmoreland (*Contrib. to Conch.*, p. 173) will prove to be a distinct species which will be called *Sagda minor* (C. B. Ad.).

The var. *delaminata* of the same author (t. c., p. 174) from Easington in the district of St. Davids is perhaps another distinct species, but it has been very inadequately described.

***Sagda spei*** n. sp. Fig. 9.

The shell is of moderate size, solid, elevated, the height about 85 per cent. of the diameter, white under a thin pale brown-tinted cuticle; quite glossy. The spire is broadly dome-shaped above. Whorls about 8, moderately convex, the first  $1\frac{1}{2}$  nearly smooth, the rest sculptured with fine, slightly curved, retractive striae, which in large specimens are usually weaker on the last whorl. Under a strong lens very feeble traces of granulation are barely perceptible in places between the striae on the last whorl. The last whorl in a front view is more than twice the height of the preceding whorl. It is convex beneath and moderately excavated in the center. The aperture is lunate. The basal lamella is about a half whorl long, well developed, and revolves at the point of greatest convexity of the base. The columellar lamella though distinct is very small.

Alt. 18, diam. 21.3 mm.; whorls 8.

“ 16, “ 19.5 “ “  $7\frac{1}{2}$ .

Hope River region, the types from Hall's Delight, St. Andrew, No. 88,715, A. N. S. P.

This is a rather common snail eastward from Kingston. It differs from *S. jayana* (C. B. Ad.) by the rudimentary columellar lamella and by having the basal lamella situated further inward from the periphery. In the structure of the lamellæ it resembles *S. grandis* P. and B., from which it differs by the greater height of the last whorl, the totally distinct secondary sculpture, and the smaller apical whorl. *S. connectens* has the basal lamella more peripherally situated, and the spire is much lower. *S. alveare* (Pfr.) has a more conic spire and lower last whorl, but in the collection of the Academy numerous lots of this species were so labelled.

*Sagda epistylodes* Fér. is, according to the original figures, a shell of about the size of *S. spei*; but it is represented as far more

coarsely sculptured. We have seen no *Sagda* agreeing with Férussac's figures.

One of us found many long-dead shells of *S. spei* in a thicket on the western slope of Long Mountain at Rockfort. The shells are small and low but otherwise agree with the types. Two apparently adult examples measure:

Alt. 13, diam. 17.5 mm.; whorls  $7\frac{1}{2}$ .

" 12, " 16 " " 7.

***Sagda anodon* n. sp.**

The shell is imperforate, rather thin, the height usually about three-fourths the diameter; white under a thin smooth pale yellow cuticle. Spire convexly low conic, the apex projecting slightly. Whorls about  $6\frac{1}{2}$ , slightly convex very slowly increasing, irregularly, rather weakly striate. The periphery is broadly rounded. Base convex, excavated in the center. Aperture lunate, without internal lamellæ.

Alt. 9.8, diam. 13.8 mm.

" 9.5, " 13 "

" 8.5, " 13.3 "

Rockfort, near Kingston. Types No. 101,137, A. N. S. P., collected by Dr. A. P. Brown, May, 1910.

The type lot consists of "dead" shells. A fresh one, not quite mature, collected at Rockfort by Mr. Wm. J. Fox, supplied the item of color. It is possible that this shell is the *Helix epistylum* var. *delaminata*, very inadequately described by Professor C. B. Adams, from Easington, St. Davids, a place some distance east from Rockfort.

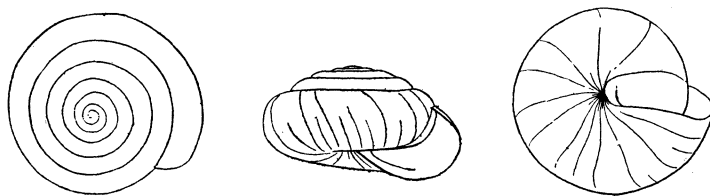


Fig. 10.—*Sagda simplex*.

***Sagda simplex* n. sp. Fig. 10.**

The shell is imperforate, much depressed, the height slightly over half the diameter (56 to 57 per cent.); thin, white under a very thin, glossy pale yellowish cuticle. Spire convex, whorls  $6\frac{1}{2}$  to  $6\frac{3}{4}$ , slightly convex, very slowly increasing, with weak sculpture of irregular growth-wrinkles. The last whorl is rounded peripherally, convex beneath, rather broadly but not deeply excavated around the axis. The aper-

ture is lunate, the columellar margin thickened near and at its insertion in the center. There are no internal lamellæ.

Alt. 7.3, diam. 13 mm.

" 6.9, " 12 "

" 6.9, " 12.3 "

Somerset, Manchester. Types No. 101,140, A. N. S. P., collected by Dr. A. P. Brown, May, 1910.

This form is apparently what Professor C. B. Adams described as *Helix osculum* var. *delaminata*; but if so this name is barred by the prior *H. epistylium* var. *delaminata* C. B. Ad., which is probably a valid species. While the shell under consideration resembles *Sagda osculans* closely in form, it differs constantly, in a very large series collected in the Mandeville region, by the total absence of internal laminae. The laminate *S. osculans* was not taken in this region. We have no evidence whatever that the two forms intergrade, and are decidedly of the opinion that both are distinct and valid species.

**Spirostemma mandevillensis** n. sp. Fig. 11.

The shell is pillar-shaped, the diameter contained 6 to  $6\frac{1}{2}$  times in the length, widest near the middle, tapering very slowly and slightly towards both ends; brown, rather dark when living; widely truncate above, the breach closed by a strongly convex plug. Whorls remaining are nearly flat, the last one shortly free in front, very strongly keeled, at the base, concave just above and below the keel. The sculpture is of fine, regular, extremely oblique retractive striae, which are about as wide as their intervals. The aperture is small, its greatest length contained  $6\frac{1}{2}$  to  $7\frac{1}{2}$  times in the length of the shell, very oblique, obovate, being angular below, broadly rounded above. Peristome pale, continuous, narrowly expanded throughout. The internal axis is very slender, nearly straight in the upper whorls. It begins to be sinuous in the seventh, becoming progressively more broadly spiral from there to the last. In an obliquely basal view in the mouth a large false umbilicus is seen, about one-third as wide as the last whorl.

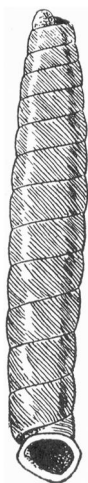


Fig. 11.

Length 14.3, diam. 2.2, length of aperture with peristome 1.9 mm.; whorls  $12\frac{3}{4}$ .

Length 13.3, diam. 2.25, length of aperture with peristome 2 mm.; whorls  $12\frac{1}{2}$ .

Somerset Road, about two miles from Mandeville. Types No. 101,172, A. N. S. P., collected by Dr. A. P. Brown, 1910.

This species stands between *S. tenella* and *S. elatior* (C. B. Ad.). *S. tenella* is a paler, smaller and more delicate species, with the aperture less or not at all protracted. *S. elatior* is larger, more finely striate shell, with the axis gyrate in a greater number of whorls.

**Varicella (Varicellula) rapax** n. sp. Fig. 12.

The shell is lanceolate, slender, the length about  $3\frac{1}{2}$  times the diameter, thin, corneous, glossy. The outlines of the spire are very slightly convex, nearly straight; apex obtuse. Whorls  $6\frac{1}{2}$ , moderately convex. The first  $1\frac{1}{2}$  whorls are smooth; then narrow vertical impressed lines appear, faint and widely spaced at first, soon becoming deeper, the last four whorls sculptured with nearly regular vertical grooves parted by much wider convex intervals (or wide, very low, convex riblets parted by narrow grooves). On the face of the last whorl there are about 3 such riblets in one millimeter; they are a little more crowded on the last part of the whorl. They extend undiminished to the base. There are also a few very ill-defined slightly deeper varix grooves, two on the last, three on the penultimate whorl. The suture is margined by transparency. The aperture is lanceolate, quite narrow in the upper third, 40% the length of the shell. The outer lip arches well forward in the middle, retracting above and below. The columella is quite short, vertical, very obliquely truncate at its base. In basal view no "false umbilicus" is visible. Length 10.5, diam. 3, length of aperture 4.6 mm.

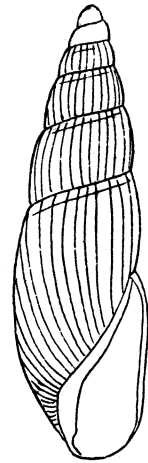


Fig. 12.

Somerset, Manchester. Type No. 101,421, A. N. S. P., collected by Dr. A. P. Brown, 1910.

This species resembles *V. puella* (C. B. Ad.) in form of the shell and columella, but differs from it by the very much coarser sculpture. *V. tenera* (C. B. Ad.) is a much more slender species, which approaches the new form in sculpture. *V. rapax* certainly differs from all of the numerous Varicellas described by C. B. Adams, the types of which have been redescribed and figured by one of us. Fresher specimens of *V. rapax* may perhaps show brown streaks along the indistinct varix-grooves.

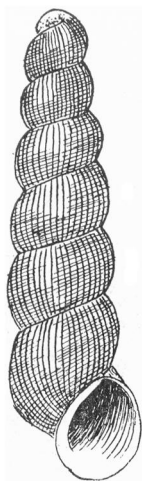
***Geomelania (Scalatella) microglypta* n. sp. Fig. 13.**

Fig. 13.

The shell is minutely rimate, slender, columnar, tapering very slowly to the obtuse (truncated) summit, grayish-white.  $6\frac{1}{2}$  whorls remaining are very convex, the suture deeply impressed. Sculpture of longitudinal ribs somewhat wider than the intervals, and about .055 mm. from crest to crest, on the last two whorls; over the ribs and intervals run many fine spiral threads, of which there are about 36 on the penultimate whorl. The aperture is ovate, outer lip obtuse, expanded; in profile straight or slightly concave above the periphery, regularly arching forward at the lower outer portion. Length 4.1, diam. 1.1, length of aperture 1 mm.

Near Mandeville. Types No. 101,345, A. N. S. P., collected by A. P. and S. Brown, 1910.

In figure and size this species hardly differs from *G. pygmaea* C. B. Ad., but the sculpture is very much finer and closer.

***Rhytidopoma fraterminor* n. sp. Fig. 14.**

The shell is perforate, turrit, rather slender, thin, variable in color: dark reddish-brown, the striae lighter, or pale yellow with vertical series of brown spots formed by the interruption of spiral bands, of which there are six on the last whorl, the next to the lowest one nearly continuous; or it may be uniform pale yellowish. In individuals retaining the spire the latter tapers regularly to the obtuse apex; but the early whorls are usually lost, leaving 5 to  $5\frac{1}{2}$  in adult shells. Whorls  $7\frac{1}{2}$ , strongly convex, the last fourth of the last whorl descends, running free from the preceding whorl, separated from it at the aperture by a distance about equal to the width of the outer lip. The embryonic shell consists of 2 whorls, the first  $1\frac{1}{2}$  smooth, the next half whorl minutely striate. After that sharp strongly raised, narrow striae appear, arranged in groups of 3 or 4 on the third whorl, mostly by pairs on the next two whorls; after which the striae are in groups of 4 or 5, the first one largest, the rest gradually diminishing. The groups are separated by plain spaces. On the last 3 or 4 whorls two or three larger striae of each group become higher and lamellar near the suture above, where they project strongly.

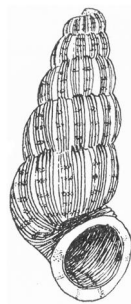


Fig. 14.



Aperture oval, the inner outline less curved than the outer. Peristome thin, flatly reflexed, whitish with several brown spots, sometimes indistinct, wider on the outer and basal margins, and having a barely projecting inner rim.

Length 9.5, diam. 4 mm., width of outer lip .3 mm.,  $5\frac{1}{2}$  whorls remaining.

Length 10, diam. 4.2 mm., apex entire.

Length 7, diam. 3.2 mm.,  $4\frac{1}{2}$  whorls remaining.

Wesley Mount Church, near Williamsfield. Types No. 101,503, A. N. S. P., collected by Dr. A. P. Brown, 1910.

This species is closely related to *R. campbelli* (C. B. Ad.), but it is very much slenderer, less robust, with a much more slowly tapering spire and without the strong spiral cords in the umbilical region characteristic of *R. campbelli*. Seven specimens were taken, one having the spire entire.

The striae are undulated in the darkest specimens, but not noticeable in the light ones.

#### CYCLOPHORIDÆ.

This family is represented by a single genus in Jamaica. There has been a good deal of uncertainty about the proper generic name for the group among the several following:

*Aperostoma* Troschel, Zeitschrift für Malakozoologie, IV, 1847, p. 44; cf. Pfeiffer, *l. c.*, pp. 44 and 104. Fischer, Manual de Conchyliologie, p. 744; and von Martens, Biologia Centrali Americana, Mollusca, p. 300 [type *C. blanchetianus*].

*Crocidopoma* Shuttleworth, Journal de Conchyl., V, 1857, p. 271 (for *C. floccosum* and *C. suturale*) [type *C. suturale*].

*Playstoma* Mörch, Malak. Blätter, VII, 1869, p. 66. Not *Playstoma* Meigen, 1803.

*Neocyclotus* Fischer et Crosse, Mission Sci. au Mexique, Moll., II, p. 148 [type *C. dysoni* Pfr.].

*Ptychocochlis* Simpson, Proc. U. S. National Museum, XVII, 1895, p. 431, type *Neocyclotus jamaicensis*.

*Plectocyclotus* Kobelt und Moellendorff, Cat. gegenw. Pneumonopomen, p. 138 (34) [type *C. jamaicense* Sowb.].

*Aperostoma* was proposed, as Fischer and Crosse have pointed out, for three very diverse species, belonging to as many genera; but Pfeiffer, in the same year commented upon this fact, and restricted the group to American Cycloti, giving a list of the species. This restriction was accepted by Fischer (1885) and by von Martens (1890). The genus *Neocyclotus* was therefore superfluous. *Crocidopoma* seems to us to be only a subgenus of *Aperostoma*, not a separate genus.

For the group of corrugated Jamaican species the subgeneric term *Ptychocochlis* Simpson should be used. *Plectocyclotus* Kob. et Mlldff. is an absolute synonym.

*Ptychocochlis* is a somewhat difficult group in the present condition of the literature. Chitty's monograph is not all that could be desired; yet his major grouping of the species by characters of the operculum is doubtless sound.

The species long known as "*jamaicensis* Chemnitz" is certainly not the Chemnitzian form, which was really *portlandensis* of Chitty. As Chemnitz was not binomial, this use of the name was of no effect. "*Cyclostoma jamaicensis*" next figured in the supplement of Wood's *Index Testaceologicus*, but the figure given defies identification, and may or may not represent the *jamaicensis* of Sowerby's *Thesaurus Conchyliorum*, where the first recognizable, though not very good, figures are given. We would therefore call the species *Aperostoma jamaicense* (Sowerby).

***Aperostoma (Ptychocochlis) lacteofluviae* n. sp.**

The shell is umbilicate, the umbilicus contained  $5\frac{1}{2}$  times in the diameter; rather depressed, the height two-thirds the diameter; solid, covered with a chestnut cuticle. The spire is low and small; whorls  $4\frac{1}{2}$ , very convex, very finely striate radially, the first  $1\frac{3}{4}$  nearly smooth. Small waves then appear, at first radial in direction, but after  $2\frac{1}{2}$  whorls they become strong, regular, protractive, not reaching either suture. After the first third of the last whorl the waves weaken and are replaced by ill-defined depressions longer in the spiral direction. At the periphery and base there are a few inconspicuous, coarse spirals. The basal keel is low, defined by a depression within, and sometimes with a few pits outside. The aperture is oblique, rotund, angular above, reddish-brown within, the lip whitish, outer and inner margins about equally curved. Alt. 10.5, diam. 16 mm.

The operculum is rather strongly concave outside, and bears a spiral lamella which makes 7 turns and terminates in a central pit as usual. At the outer whorls, the edge of this lamina is reflexed outwardly and flattened, almost meeting across the interval. Inside it is yellow and slightly convex. Diameter 5 mm.

Round Hill, Milk River, Clarendon, the types No. 101, 193, A. N. S. P., received from Mr. George H. Clapp.

This is a species of Chitty's group 1, somewhat related to *A. notatum* Chitty, but distinct in sculpture, etc.

***Aperostoma (Ptychocochlis) tryonianum* n. sp.**

The shell is rather openly umbilicate, the diameter of the umbilicus half the width of the aperture; height about 70 per cent. of the diameter; white under a thin yellow cuticle which has a tendency to be

deciduous in several narrow bands on the last whorl. Spire low-conic, the apex rather acute. Whorls  $4\frac{1}{2}$ , tubular, the first  $1\frac{1}{2}$  nearly smooth, the rest having a sculpture of fine, close, thread-like radial striæ, closer and less regular on the last whorl. There is no trace of corrugation. The last whorl is rounded, with no trace of a keel or ridge on the base. Aperture nearly circular, not angular above, slightly oblique, the thin peristome in contact with the preceding whorl for a very short distance only.

Alt. 10, diam. 14 mm.

Operculum evenly and moderately concave outside, bearing a spiral lamina of fully 7 whorls outside of the central depression. This lamina flares broadly outward, leaving but a narrow space between the turns; and its outer end is not conerescent with the preceding turn. The inside is convex in the middle. Diameter 5 mm.

Jamaica. Type No. 101,141, A. N. S. P., from the G. W. Tryon collection.

A species of Chitty's group No. 1, apparently related to the small variety of *A. notatus*, but with no trace of a basal keel or corrugation.